Yersiniosis

1. DISEASE REPORTING

A. Purpose of Reporting and Surveillance

1. To identify sources of transmission (e.g., a commercial product) and to prevent further disease transmission from such sources.
2. To collect data that will help investigate an outbreak should cases be part of an outbreak.
3. To better characterize the epidemiology of this organism.

B. Legal Reporting Requirements

1. Health care providers: notifiable to local health jurisdiction within 3 work days.
2. Hospitals: notifiable to local health jurisdiction within 3 work days.
3. Laboratories: no requirements for reporting.
4. Local health jurisdictions: notifiable to the Washington State Department of Health (DOH) Communicable Disease Epidemiology Section (CDES) within 7 days of case investigation completion or summary information required within 21 days.

C. Local Health Jurisdiction Investigation Responsibilities

1. Initiate appropriate infection control measures.
2. Report all confirmed cases to CDES. Complete the yersiniosis case report form (http://www.doh.wa.gov/notify/forms/yersin.doc) and enter the data into the Public Health Issues Management System (PHIMS).

2. THE DISEASE AND ITS EPIDEMIOLOGY

A. Etiologic Agent

Yersinia is a gram-negative bacillus. In this country, intestinal infection in humans is caused by *Y. enterocolitica* and less commonly *Y. pseudotuberculosis*. For both species, serotypes causing disease may vary in different geographic areas; *Y. enterocolitica* type O8 strains and more recently O3 are responsible for most outbreaks in the United States. *Y. pestis* is discussed as plague.

B. Description of Illness

Yersiniosis is an acute intestinal infection typically occurring as acute febrile diarrhea (especially in young children) which may be bloody. Involvement of abdominal lymph nodes causing right sided abdominal symptoms may be mistaken for appendicitis (especially in older children and adults). Complications include erythema nodosum (in about 10% of adults, particularly women), postinfectious arthritis (with a predilection for HLA-B27 genetic type), and bloodstream infection. These complications tend to resolve within a few months. Septicemia occurs most often among people with iron overload (e.g., hemochromatosis) or those with underlying immunosuppressive illness or therapy.

C. Yersiniosis in Washington State

DOH has received 20 to 40 reports of yersiniosis per year during recent years with no associated deaths in over 15 years. In the past few years, approximately 25% of reported cases were under five years of age. Potential sources of infection in Washington residents include pork consumption or the presence of uncooked pork products in the household. Untreated water and contact with animals are also reported as potential routes of exposure. Outbreaks are uncommon, with most cases occurring sporadically.

D. Reservoirs

Animals are the principal reservoir for *Yersinia*. The pig is the principal reservoir for pathogenic *Y. enterocolitica*; asymptomatic pharyngeal carriage is common in swine, especially in the winter. *Y. pseudotuberculosis* is widespread among many species of avian and mammalian hosts, particularly among rodents and other small mammals.

E. Modes of transmission

Transmission takes place by eating and drinking contaminated food or water, or by contact with infected animals or less commonly infected people. *Y. enterocolitica* has been isolated from a variety of foods; however, pathogenic strains are most commonly isolated from raw pork or pork products. In the United States, preparation of chitterlings in the household may result in infection; related outbreaks have been reported in other states. In contrast to most foodborne pathogens, *Y. enterocolitica* is able to multiply under refrigeration and low oxygen conditions. *Y. enterocolitica* has been recovered from natural bodies of water. Sick animals have been implicated including farm animals and pets such as kittens and puppies. Nosocomial transmission has been reported, as well as rare reports of transmission by blood transfusion from donors who had no symptoms or mild gastrointestinal illness.

F. Incubation period

Not known with certainty but probably 3–7 days, generally under 10 days.

G. Period of communicability

Although fecal shedding occurs with diarrhea and may persist for a prolonged period after symptoms resolve, secondary transmission is rare.

H. Treatment

Uncomplicated cases of diarrhea due to *Y. enterocolitica* typically resolve without antibiotic treatment. However, in more severe or complicated infections, antibiotics such as aminoglycosides, doxycycline, trimethoprim-sulfamethoxazole, or fluoroquinolones may be useful. The organism is usually resistant to penicillin and first generation cephalosporins.

3. CASE DEFINITIONS

A. Clinical Criteria for Diagnosis

A febrile diarrheal illness. A typical clinical presentation may include fever, diarrhea and abdominal pain, but some patients with mesenteric lymphadenitis may present with abdominal pain alone. Reactive arthritis and septicemia may occur.

B. Laboratory Criteria for Diagnosis

Isolation of *Y. enterocolitica* or Y. *pseudotuberculosis* from stool, urine, or a normally sterile site.

C. Case Definition (DOH)

Confirmed: a clinically compatible case that is laboratory confirmed.

4. DIAGNOSIS AND LABORATORY SERVICES

A. Diagnosis

The diagnosis of yersiniosis is made by isolation of *Yersinia enterocolitica* or *Y. pseudotuberculosis* from stool or less commonly from urine, blood, lymph nodes, joint fluid, or other normally sterile site. Identifying the organism in stool may require special techniques that are not routinely performed in some laboratories so specific testing for the agent should be requested when yersiniosis is suspected.

B. Tests Available at DOH Public Health Laboratories (PHL)

In outbreak or other special situations, DOH Public Health Laboratories can culture stool specimens for *Yersinia*. Please consult with a CDES epidemiologists prior to sending specimens.

C. Specimen Collection

For stool culture, use a sterile applicator swab to collect stool, insert the swab into Cary-Blair transport medium, push the cap on tightly, label the tube, and mail immediately.

Please enclose a completed PHL Enteric Bacteriology form (available at: http://www.doh.wa.gov/EHSPHL/PHL/Forms/EntericBacteriology.pdf) with all isolates and stool specimens.

5. ROUTINE CASE INVESTIGATION

Interview the case and others who may be able to provide pertinent information.

A. Identify Source of Infection

Ask about the following exposures in the 3–10 days prior to onset:

- Consumption of raw pork
- Consumption of unpasteurized milk or unpasteurized dairy products (e.g., soft cheeses made with raw milk)
- Handling or preparation of raw pork in the household, including chitterlings (pig intestines)
- Contact with pigs
- Contact with other animals including pet dogs, cats, rodents and birds
- Consumption of water potentially contaminated with animal or human feces

B. Identify Potentially Exposed Persons

Collect name, age, onset date, and contact information of people with similar illness.

C. Environmental Evaluation

An environmental evaluation is usually not needed since the source of the infection is rarely determined with certainty. Contact CDES if you have high suspicion for a source of infection.

6. CONTROLLING FURTHER SPREAD

A. Infection Control Recommendations

1. Hospitalized patient should be cared for using standard precautions. In addition, contact precautions should be used for diapered or incontinent persons for the duration of illness or to control institutional outbreaks.
2. The case should be educated regarding effective hand washing, particularly after using the toilet, changing diapers, and before preparing or eating food.
3. Work or child care restrictions: Food handlers, child care attendees and providers and health care personnel with diarrhea should be excluded from work while symptomatic; however, no specific measures are needed to prevent or control transmission from asymptomatic carriers.
4. If a suspected source of infection is identified and has the potential for transmitting infection to a defined population, advise those individuals on measures to avoid exposure.

B. Case Management

Stool cultures to document that fecal shedding of the organism has stopped are not routinely indicated.

C. Contact Management

Person-to-person transmission of yersiniosis is uncommon.

D. Environmental Measures

In outbreak situations, implicated food products will be recalled.

7. MANAGING SPECIAL SITUATIONS

A. Outbreaks

Although rare, yersiniosis outbreaks are important to identify and investigate, particularly if young children are affected. However, such investigations are difficult, require special questionnaires and active surveillance, and may involve complex environmental evaluations. Consultation with CDES is essential before beginning any special investigation.

8. ROUTINE PREVENTION

A. Vaccine Recommendations: None

B. Prevention Recommendations

- Avoid eating raw or undercooked meat, particularly pork and pork products.
- Consume only pasteurized milk or milk products.
- Avoid drinking untreated water.

- Wash hands with soap and water before eating and preparing food, after contact with animals, and after handling raw meat.
- After handling raw chitterlings (pig intestines), clean hands and fingernails scrupulously with soap and water before touching infants or their toys, bottles, or pacifiers. Someone other than the food handler should care for children while chitterlings are being prepared.
- Prevent cross-contamination in the kitchen:

  Use separate cutting boards for meat and other foods.

  Carefully clean all cutting boards, counter-tops, and utensils with soap and hot water after preparing raw meat.
- Dispose of animal feces in a sanitary manner.
- During the slaughtering of pigs, remove the head and neck from the body to avoid contaminating meat from the heavily colonized pharynx.

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UPDATES